



Innovative Naval Prototype (INP) Transformable Craft (T-Craft)

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At a Glance

What is it?

■ The **T-Craft** INP is a vessel which can operate in multiple modes. It can self deploy from an intermediate support base to the sea base and then be used as a high speed connector from the sea base to the shore, transporting wheeled and tracked vehicles and other heavy equipment and cargo through the surf zone and onto the beach, where it can discharge its cargo without the need for a port.

How does it work?

■ The **T-Craft** INP program is investigating/developing multiple technologies that will allow a single vessel to transform operational modes and accomplish the **T-Craft** mission.

What will it accomplish?

■ The **T-Craft** will deliver game changing capability in the way material and personnel are transported from the sea base and onto the shore. It will be capable of long range open ocean transit (2500 nm at 20 kts), cargo transfer at the sea base in high sea states, high speed transit between the sea base and the shore (500 nm range at 40 kts), and the ability to transform to a fully amphibious vehicle—delivering material and personnel “feet dry” on the beach.

Point of Contact:

Kelly Cooper
(703) 696-0869
kelly.cooper@navy.mil



The Office of Naval Research conceived the Innovative Naval Prototype (INP) program concept in March 2004 with the idea of exploring technologies that could have a game changing impact on the way the Navy operates. The Sea Base Enablers **T-Craft** INP was one of the four original INP programs proposed. The **T-Craft** program is a three-phase effort. Phase One, completed in November 2007, consisted of initial concept design and technology exploration.

Phase II, scheduled to run through May 2010, will consist of further design and technology development and scale model construction and testing. Finally, Phase III, scheduled to start in mid-2010 and complete within four years, will consist of construction and testing of a full-scale **T-Craft** prototype demonstrator.

The **T-Craft** program consists of multiple technology challenges which are all necessary in order to achieve the **T-Craft** vision. Multi-mode propulsion systems are being developed which will allow the craft to achieve long range, fuel efficient open ocean transit, high speed transit between the sea base and the shore, and amphibious propulsion. Aluminum, titanium, and composites are being investigated as possible hull and structural materials. Variable geometry bow and stern seals and retractable side skirts are under development to allow the vessel to transform to an amphibious craft. Ramp technologies and dynamic positioning systems are necessary to accomplish material transfer at the sea base in high sea states, and advances in automation and human systems integration are required to allow the **T-Craft** to be operated with a minimal crew. New technologies that will be investigated and/or developed for the program include: catamaran/Surface Effect Ship hull forms, multi-mode propulsion systems (including hybrid electric drive), inflatable bow and stern seals, retractable side skirts, ramp technologies and dynamic positioning systems, lift fan developments, automation, and human systems integration.

The primary warfighter payoff of the **T-Craft** INP program will be its ability to deliver “feet dry” on the beach four to 10 times the payload of current craft in a vessel which can self deploy from an intermediate support base to the sea base. Currently, similar operations require multiple vessels and longer timelines.

Research Opportunities:

- Cargo transfer at the sea base in high sea states
- Transition from a Surface Effect Ship (SES) to an Air Cushioned Vehicle (ACV) to achieve a true amphibious capability
- Multi-mode propulsion systems (including hybrid electric drive), both in and out of water, inflatable bow and stern seals, retractable side skirts, ramp technologies and dynamic positioning systems, lift fan developments, automation, and human systems integration

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